



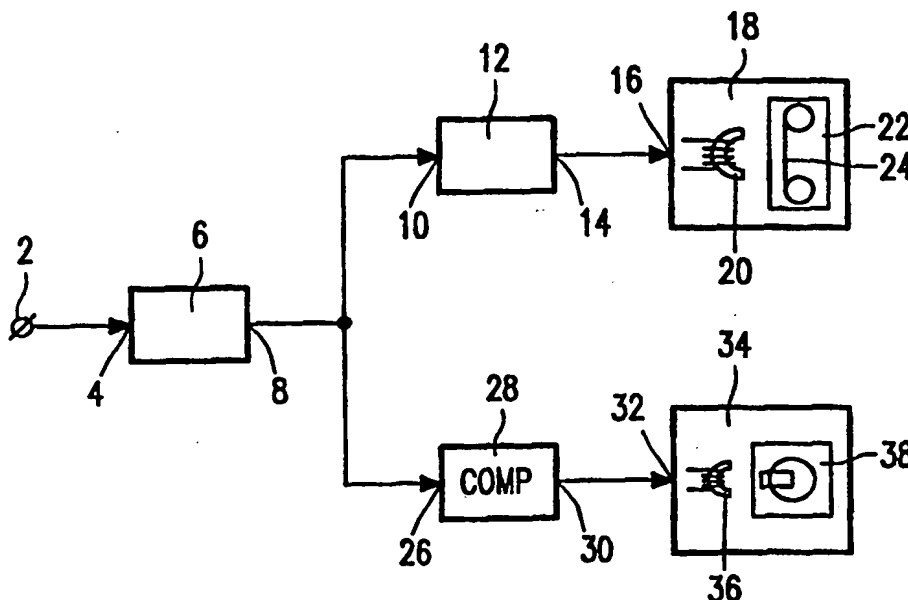
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/IB97/01273</b></p> <p>(22) International Filing Date: 13 October 1997 (13.10.97)</p> <p>(30) Priority Data: 96202908.8 18 October 1996 (18.10.96) EP (34) Countries for which the regional or international application was filed: <b>AT et al.</b></p> <p>(71) Applicant: <b>PHILIPS ELECTRONICS N.V. [NL/NL];</b> Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).</p> <p>(71) Applicant (for SE only): <b>PHILIPS NORDEN AB [SE/SE];</b> Kottbygatan 7, Kista, S-164 85 Stockholm (SE).</p> <p>(72) Inventors: <b>SCHMALE, Peter, Christiaan; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). MOELANDS, Antonius, Gerardus; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SNOECK HENKEMANS, Dirk, Pieter; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SLOT, Steven, Thomas; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). STEKELENBURG, Michael, Alwin, Willem; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).</b></p>	<p>(74) Agent: <b>VAN DER KRUK, Willem, L.;</b> Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).</p> <p>(81) Designated States: <b>JP, KR, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</b></p> <p><b>Published</b> Without international search report and to be republished upon receipt of that report.</p>	

(54) Title: RECORDING OF AN INFORMATION SIGNAL SO AS TO ENABLE EDITING

## (57) Abstract

A recording apparatus, such as accommodated in a camcorder housing, is provided with a recording unit (18) for recording a video signal on a removable record carrier (24), such as a magnetic tape accommodated in a cassette (22) which is removable from the apparatus. Further, a storing unit (34) is present for storing a data compressed video signal in a random access memory (38). The random access memory (38) is removable from the apparatus. The apparatus is adapted to simultaneously record the video signal on the removable record carrier (24) and store the video signal in the removable random access memory (38). Further, a timing signal generator unit (6) is present for adding equal timing signals to the corresponding pictures included in the data compressed video signal and in the processed video signal.



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Recording of an information signal so as to enable editing.

The invention relates to a recording apparatus recording apparatus for recording an information signal on a removable record carrier or for storing an information signal in a random access memory, the recording apparatus comprising

- input means for receiving the information signal,
- 5 - first signal processing means for processing the information signal so as to obtain a processed information signal suited for recording on the removable record carrier,
- recording means for recording the processed information signal on the removable record carrier,
- 10 - data compression means for data compressing the information signal so as to obtain a compressed information signal,
- storing means for storing the data compressed information signal in the random access memory,
- timing signal generator means for generating timing signals.

15           The information signal can be any signal, such as an audio signal or a video signal.

20           An apparatus as defined in the opening paragraph is known from US 4,963,995, which is document D1 in the list of related documents.

          The apparatus is meant for editing a videosignal recorded on the removable record carrier, such as a magnetic tape in a cassette. During the editing process, the random access memory is used to realize editing. The known apparatus is disadvantageous as the editing process is very time consuming.

25

          The invention aims at providing an apparatus as defined in the foregoing which offers the possibility of a less time consuming editing. The apparatus in accordance with the invention is characterized in that

- the random access memory is removable from the apparatus,
- the recording apparatus is adapted to simultaneously record the information signal on the removable record carrier and store the information signal in the removable random access memory,
- 5 - the timing signal generator means further being adapted to add equal timing signals to corresponding information portions included in the data compressed information signal and in the processed information signal.

More specifically, when recording an information signal in the form of a video signal, the apparatus is characterized in that

- 10 - the random access memory is removable from the apparatus,
- the recording apparatus is adapted to simultaneously record the video signal on the removable record carrier and store the video signal in the removable random access memory,
- the timing signal generator means further being adapted to add equal timing
- 15 signals to the corresponding pictures included in the data compressed video signal and in the processed video signal.

The invention will be explained hereafter in an application where a video signal is recorded and subsequently edited.

The invention is based on the following recognition. Editing in the known  
20 apparatus requires reviewing the video signal as recorded on the record carrier, which is more specifically a longitudinal record carrier (eg. magnetic tape). The access time of a longitudinal record carrier is however very large. So finding the edit points, using a longitudinal record carrier is very time consuming. After having found the edit points, the random access memory is used to realize the edit step itself.

25 In accordance with the invention, the video signal to be edited is recorded on the record carrier as well as stored in the random access memory. Further, corresponding pictures in the video signals recorded on the record carrier and stored in the random access memory have the same timing signals added to them. After having terminated the recording of the video signal, the edit process should be carried out on the video signal.

30 The edit process can be realized either using the apparatus itself, or in a remote edit apparatus, as the random access memory is also removable from the apparatus. This is an advantage, especially in the case that the recording apparatus is included in a camera housing. After having filmed a scene using the camera, the record carrier and the random access memory can both be removed from the apparatus and given to an editor that

realizes the editing, whereas the camera can be used again for filming another scene.

When carrying out the edit step in a remote edit apparatus, both the removable record carrier and the removable random access memory should be withdrawn from the recording apparatus and brought together to the remote editing apparatus where  
5 both removable media are inserted in the remote editing apparatus. In order to keep both the removable record carrier and the removable random access memory physically together, one can insert both media in a container. The container can have one slot for inserting the removable record carrier and a second slot for receiving the random access memory. In this  
10 container, both media can be kept together, so that the risk of not knowing which record carrier belongs to which random access memory is minimized.

In a first step in the editing process, finding the edit points can be realized using the data compressed video signal stored in the random access memory. This is less time consuming, as the access time for finding positions in the video signal stored in the random access memory is low. The edit points can be stored by storing the time code signals  
15 corresponding to the instants of the edit points.

Next, the effective editing step is carried out, using the video signal recorded on the record carrier and the time code signals corresponding to the edit points. Using the time code signals obtained in the first step, the exact locations in the video signal recorded on the record carrier can be found by comparing the time code signals of the edit  
20 points with the time code signals retrieved from the video signal recorded on the record carrier and reproduced therefrom.

The record carrier can be a longitudinal record carrier. The video signal recorded for editing, can be recorded in one of the well known recording formats, such as any one of the well known D formats, or the well known DVC format. Such record carrier  
25 has the advantages of low costs, sufficient recording quality, shock resistance, weight, dimensions and archivability.

The DVC format includes a DCT encoding of the video signal so as to realize a data compression step on the video signal to be recorded on the record carrier. The data compression carried out on the video signal to be stored in the memory results in a data  
30 compression ratio which is larger than the data compression ratio of the first mentioned data compression step.

The random access memory may be in the form of a disc, such as a magnetic disc, or in the form of a PCMCIA card. Increasing data compression ratios for the video signal stored in the memory, can result in smaller memories being required, or larger

recording capacities to be obtained. As the video signal stored on the memory is only needed to establish the various edit points, a very high compression ratio is acceptable during data compressing the video signal prior to storage in the memory. Further, shock suppression, normally an important factor in eg. disc recording, need not be extremely high.

5 The invention is of particular importance in videocameras, which include a recording apparatus, especially in professional applications.

It should be noted that EP-A 594 241, document D2 in the list of related documents, discloses a random access memory eg. for use in a videorecorder. The random access memory is not removable from the videorecorder. Moreover, the random access  
10 memory is not meant to store in it the complete video signal to be recorded on the videocassette. Further, there is no mentioning of adding time code signals.

These and other aspects of the invention will become apparent from and  
15 further elucidated with reference to the embodiments described in the following figure description, in which

figure 1 shows a first embodiment of the apparatus,

figure 2 shows an editing apparatus,

figure 3 shows a second embodiment of the apparatus,

20 figure 4 shows the apparatus accommodated in a camcorder housing, and

figure 5 shows a container for receiving the removable record carrier and the removable random access memory, when being in the form of a PCMCIA card.

25 Figure 1 shows schematically a first embodiment of the recording apparatus. The apparatus comprises an input terminal 2 for receiving a video signal in the form of pictures that may be supplied by a camera unit (not shown). The camera unit may be included into one mechanical body with the recording apparatus so as to form a camcorder. The input terminal 2 is coupled to an input 4 of a timing signal generator unit 6 for  
30 generating timing signals, such as the SMPTE time code signals, well known in the art. An output 8 of the generator unit 6 is coupled to an input of a signal processing unit 12 and to an input 26 of a data compression unit 28. The signal processing unit 12 has an output 14 coupled to an input 16 of a recording unit 18. In the present embodiment, the recording unit 18 is a recording unit for recording an information signal on a longitudinal record carrier

(tape) 24 accommodated in a cassette 22. The recording unit 18 comprises a write head 20 for writing the information signal on the record carrier 24. The cassette 22 is removable from the apparatus.

The data compression unit 28 has an output 30 which is coupled to an input 32 of a unit 34 for storing an information signal in a random access memory 38. In the present embodiment, the unit 34 is a disk drive for storing the information on a random access memory 38 in the form of a hard disk or a floppy disk. The unit 34 has a magnetic head 36 for storing the information in the memory. The random access memory 38 is removable from the apparatus.

The apparatus has a mode in which a video signal applied to the input terminal 2 is simultaneously recorded on the record carrier 24 and stored in the random access memory 38. The video signal is supplied to the input 4 of the timing signal generator unit 6, in which subsequent timing signals are generated, one timing signal for each of subsequent pictures included in the video signal applied to the input 4, and where each timing signal is added to a corresponding picture in the video signal.

The video signal thus obtained is supplied to the input 10 of the signal processing unit 12. The processing unit 12 carries out a signal processing on the video signal applied to its input so as to obtain a processed video signal suitable for recording on the record carrier 24. Such signal processing can be a signal processing in accordance with one of the well known recording formats for video recording, such as VHS, S-VHS, 8mm or one of the well known D formats for professional recording, such as the D1, D2 or D4 standard.

The video signal thus obtained is also supplied to the input 26 of the data compression unit 28. The compression unit 28 carries out a data compression step on the video signal applied to its input so as to obtain a data compressed video signal suitable for storage in the random access memory 38. Such data compressing step can be a data compression step in accordance with one of the well known data compression methods for video signals, such as a DCT encoding or other types of video encoding methods, such as intra- and/or inter frame encoding methods, as standardized in MPEG.

Editing of the video signal recorded on the record carrier 22 and stored in the memory 38 in compressed form, is realized in the following way. It should be noted here, that editing may be realized with the same apparatus or with a remote apparatus. In the case of a remote apparatus, the record carrier 24 is removed from the apparatus shown in figure 1 by removing the cassette 22. Also the memory 38 is removed from the apparatus of figure 1. The removable record carrier 24 and the memory 38 should be kept together during

their transport to a remote editing apparatus, as they both have information of the same video signal recorded and stored in them. In order to prevent that the two media are separated from each other by accident, the media can be inserted in a container, such as the one shown in figure 5. The container 140 of figure 5 has two slots, one slot 142 for receiving the cassette 22 comprising the magnetic record carrier and a slot 144 for receiving the memory 138, that can be in the form of a PCMCIA card. The container can have an opening 146 located in the top side of the container so as to enable the moving out of the cassette 22 from the slot 144 by pushing the cassette with a thumb, in the same way as known from DCC cassettes, see eg. EP-A 493,845, document D3 in the list of related documents.

Editing is realized in the following way. First, the memory 38 is inserted in an edit apparatus, for determining the edit positions.

Figure 2 shows an embodiment of an editing apparatus, which has a read unit 40 for retrieving the data compressed video signal stored in the random access memory 38. An output 42 of the read unit 40 is coupled to an input 44 of a data expansion unit 46, which has an output 48 coupled to an input 50 of a display unit 52 and an input 54 of a timing signal extraction unit 56. An output 58 of the timing signal extraction unit 56 is coupled to an input 60 of a memory unit 62, for storing the timing signals corresponding to the edit points, to be described later.

A keyboard 64 is available for inputting commands via the line 66 to a command input 68 of the memory unit 62. In an alternative solution, the commands inputted via the keyboard 64 may be supplied to a central processing unit 72, which subsequently controls the memory unit 62 via the control line 73.

The edit points are obtained in the following way. The editor inserts the random access memory 38 into the read unit 40. The data compressed video signal stored in the random access memory 38 is retrieved therefrom in the read unit 40 and supplied to the data expansion unit 46. The data expansion unit 46 carries out a data expansion step on the data compressed video signal which is inverse to the data compression step in the data compression unit 28 of the apparatus of figure 1. The video signal thus obtained is supplied to the display unit 52 in order to enable an editor to see the video signal. The video signal is also supplied to the extractor unit 56 which extracts the timing signals, added in the generator unit 6 to the video signal, therefrom and supplies the timing signals to the output 58.

Upon identifying a position in the video signal where copying of the original material onto a second record carrier should be started, the editor presses a so-called

'start'-button on the keyboard 64, which results in a load control signal to be supplied to the input 68 of the memory 62. As a result, the timing signal present at the output 58 of the extractor unit 56 is stored in the memory 62 as a start position. Upon, next, identifying a position in the video signal where copying of the original material onto a second record carrier should be stopped, the editor presses a so-called 'stop'-button on the keyboard 64, which results in a load control signal to be supplied to the input 68 of the memory 62. As a result, the timing signal present at the output 58 of the extractor unit 56 is stored in the memory 62 as a stop position. This is continued until the complete video signal has been viewed by the editor and all start and stop positions have been stored in the memory 62.

Establishing the edit points as described above requires less time than in prior art editing systems. This for the reason that the memory 38 comprising the compressed video signal is available directly after having shot the scenes with the camera. Further, the access to specific positions in the video signal stored in the memory 38 requires practically no time because of the random access character of the memory 38.

Moreover, when recording different scenes using the camera, those scenes, as recorded, are called 'clips' and are recorded directly after each other on the record carrier. The start points of the 'clips', eg. given by the timing signals of those start points, are stored during recording the scenes, and are thus available during editing. A start point of such 'clip' in the memory can thus be approached very quickly as well.

What next follows, is the effective editing step. In order to carry out the effective editing step, the apparatus of figure 2 comprises a reading unit 82 for reading the information from the record carrier 24 accommodated in the cassette 22 and for supplying the video signal retrieved therefrom to an input 86 of a recording unit 90. A signal processing unit 94 may be present between the output 84 of the reading unit 82 and the recording unit 90. The unit 94 may be a format converter, for converting the format of the video signal read from the record carrier into a format in which the video signal is recorded on the record carrier 96. Control signals generated by the central processing unit 72 and present at the control outputs 76 and 78 can be supplied to control signal inputs 80 and 88 of the reading unit 82 and the recording unit 90 respectively.

The record carrier 24 accommodated in the cassette 22 is inserted in the reading unit 82 and a cassette 92 with a virgin record carrier 96 is inserted in the recording unit 90. Upon actuating an edit-start button (not shown) on the keyboard 64, the central processing unit 72 retrieves the first start position from the memory 62 and the transport of the record carrier 24 is started to bring the record carrier 24 at that start position, in a

manner well known in the art. One way could be to retrieve the timing signals from the video signal supplied at the output 84 and to compare the retrieved timing signals with the timing signal corresponding to the first start position. Upon reaching the first start position, the central processing unit 72 generates a control signal at its output 78 so as to switch the recording unit 90 into the recording mode. Next, the processing unit 72 retrieves the first stop position from the memory 68. Recording on the record carrier 96 is continued until the record carrier 24 reaches the first stop position. Upon reaching the first stop position, the central processing unit 72 generates a control signal at its output 78 so as to switch the recording unit 90 into a stop mode. Next, the processing unit 72 retrieves the second start position from the memory 68. The record carrier 24 is transported to the second start position under the influence of a control signal present at the output 76 of the processing unit 72. Upon reaching the second start position, the central processing unit 72 generates a control signal at its output 78 so as to switch the recording unit 90 into the recording mode. Next, the processing unit 72 retrieves the second stop position from the memory 68. Recording on the record carrier 96 is continued until the record carrier 24 reaches the second stop position. Upon reaching the second stop position, the central processing unit 72 generates a control signal at its output 78 so as to switch the recording unit 90 into a stop mode. This process is continued until the complete editing of the video signal recorded on the record carrier 24 is terminated. As a result, the record carrier 96 in the cassette 92 has an edited version of the video signal recorded on the record carrier 24.

Figure 3 shows a second embodiment of the apparatus in accordance with the invention. The apparatus of figure 3 shows a large resemblance with the apparatus of figure 1. The apparatus of figure 3 includes in addition to the elements already shown in figure 1, a data compression unit 104, which has an input 106 coupled to the output 8 of the timing signal generator unit 6 and an output to the input 10 of the signal processing unit 12'. Further, the storage unit 34' is provided with a random access memory 38' which is in the form of a PCMCIA memory card. The memory card 38' is provided with electrical terminals 110 that cooperate with electrical terminals 112 when they come into electrical contact with each other by moving the memory card 38' in the direction of the arrow 114. The electrical terminals 110 of the memory card 38' are coupled to a memory IC circuit 102 accommodated on the memory card 38'.

In the record mode, the video signal applied to the input terminal 2 is simultaneously recorded on the record carrier 24 and stored in the random access memory 38'. After having added the timing signals to the pictures of the video signal, the video

signal is supplied by the timing signal generator unit 6 to the input 106 of the data compression unit 104. The data compression unit 104 is adapted to carry out a data compression step on the video signal and to supply a data compressed video signal to its output 108. next, a signal processing is carried out on the data compressed video signal. Such signal processing can be a channel encoding step on the data compressed video signal, well known in the art. The channel encoded video signal is recorded on the record carrier 24.

The video signal thus obtained is also supplied to the input 26 of the data compression unit 28'. The compression unit 28 also carries out a data compression step on the video signal applied to its input so as to obtain a data compressed video signal suitable for storage in the random access memory 38'. The data compressed video signal obtained by the compression unit 28' is supplied to a signal processing unit 100, which takes care of the storage of the data compressed information in the memory chip 102 on the memory card 38'.

The compression ratio identifying the amount of data compression achieved in the data compression unit 28' is larger than the data compression ratio of the data compression unit 12'. The data compression realized in the compression unit 104 should be such that (practically) no loss of non-redundant information occurs, as this data compressed video signal will be subjected to the editing step already described above. The data compression realized in the data compression unit 28' can be much higher, as the data compressed information stored in the random access memory need only be used for obtaining the edit positions, as described above.

The signal processing on the video signal as carried out by the elements 104, 12' and 18 can be the well known and standardized DVC signal processing, as described in US-A 5,142,421 and US-A 5,245,483, the documents D4 and D5 respectively in the list of related documents. The compression step carried out in the compression unit 104 may be in the form of the well known DCT intraframe encoding, where subpictures of 8x8 pixels are encoded into a DCT block of coefficients, where the block of coefficients comprise a DC coefficient and a plurality of AC coefficients. The compression step carried out in the compression unit 28' could make use of the data compression carried out in the unit 104 by retrieving the DC coefficients of each DCT block only so as to obtain the compressed video signal for storage in the memory 102. In such an embodiment, the data compression units 104 and 28' can share the compression stage, which has two outputs, one for supplying the DCT intraframe encoded video signal and the other for supplying the DC coefficients only.

Figure 4 shows a camcorder, having the apparatus in accordance with the invention accommodated in the camcorder housing. The camcorder is provided with an

optical unit 130 with a camera lens and a picture pickup unit, such as an CCD pickup unit, and the apparatus 132 in accordance with the invention. The camcorder has a space 134 for receiving a cassette provided with a tape-like record carrier. Further, an opening 136 is provided for inserting a random access memory into the camcorder, which is accommodated  
5 on memory card 138.

Whilst the present invention has been described with respect to preferred embodiments thereof, it is to be understood that these are not limitative examples. Thus, various modifications may become apparent to those skilled in the art, without departing from the scope of the invention, as defined by the claims. As an example, the invention  
10 could be applied to the editing of audio signals, instead of video signals. In that situation, the audio signal received for recording is stored on the record carrier and stored in the memory, after data compression. Again, timing signals are added to both the signals recorded on the record carrier and stored in the memory. Equal timing signals are added to corresponding signal portions of the audio signal, as recorded on the record carrier and stored in the  
15 memory. This can be realized by splitting the audio signal into signal blocks and recording the signal blocks on the record carrier and data compressing and storing the signal blocks in the memory. Corresponding signal blocks on the record carrier and in the memory have the same time code. Further, the invention lies in each and every novel feature or combination of features as herein disclosed.

## List of related documents

- |      |                             |
|------|-----------------------------|
| (D1) | US 4,963,995                |
| (D2) | EP-A 594 241 (PHN 14.217)   |
| (D3) | EP-A 493,845 (PHN 13.530)   |
| (D4) | US-A 5,142,421 (PHN 13.537) |
| (D5) | US-A 5,245,483 (PHN 13.546) |

Claims

1. Recording apparatus for recording an information signal on a removable record carrier or for storing an information signal in a random access memory, the recording apparatus comprising

- input means for receiving the information signal,
- 5 - first signal processing means for processing the information signal so as to obtain a processed information signal suited for recording on the removable record carrier,
- recording means for recording the processed information signal on the removable record carrier,
- 10 - data compression means for data compressing the information signal so as to obtain a compressed information signal,
- storing means for storing the data compressed information signal in the random access memory,
- timing signal generator means for generating timing signals,
- 15 characterized in that
  - the random access memory is removable from the apparatus,
  - the recording apparatus is adapted to simultaneously record the information signal on the removable record carrier and store the information signal in the removable random access memory,
  - 20 - the timing signal generator means further being adapted to add equal timing signals to corresponding information portions included in the data compressed information signal and in the processed information signal.

2. Recording apparatus for recording a video signal on a removable record carrier or for storing a video signal in a random access memory, the recording apparatus  
25 comprising

- input means for receiving the video signal,
- first signal processing means for processing the video signal so as to obtain a processed video signal suited for recording on the removable record carrier,
- recording means for recording the processed video signal on the removable

record carrier,

- data compression means for data compressing the video signal so as to obtain a compressed video signal,
- storing means for storing the data compressed video signal in the random access memory,
- timing signal generator means for generating timing signals,

characterized in that

- the random access memory is removable from the apparatus,
- the recording apparatus is adapted to simultaneously record the video signal on the removable record carrier and store the video signal in the removable random access memory,
- the timing signal generator means further being adapted to add equal timing signals to the corresponding pictures included in the data compressed video signal and in the processed video signal.

3. Recording apparatus as claimed in claim 2, characterized in that data compression means being adapted to data compress the video signal into first and second data compressed video signals, the data compression ratio for data compressing the video signal into the first data compressed video signal being smaller than the data compression ratio for data compressing the video signal into the second data compressed video signal, the first signal processing means being adapted to process the first data compressed video signal so as to obtain a processed first data compressed video signal suited for recording on the removable record carrier, the recording means being adapted to record the processed first data compressed video signal on the removable record carrier, and the storing means being adapted to store the second data compressed video signal in the random access memory.

4. Recording apparatus as claimed in claim 1, 2 or 3, characterized in that the removable random access memory is in the form of a disc, such as a magnetic disc.

5. Recording apparatus as claimed in claim 1, 2 or 3, characterized in that the removable random access memory is in the form of a PCMCIA card.

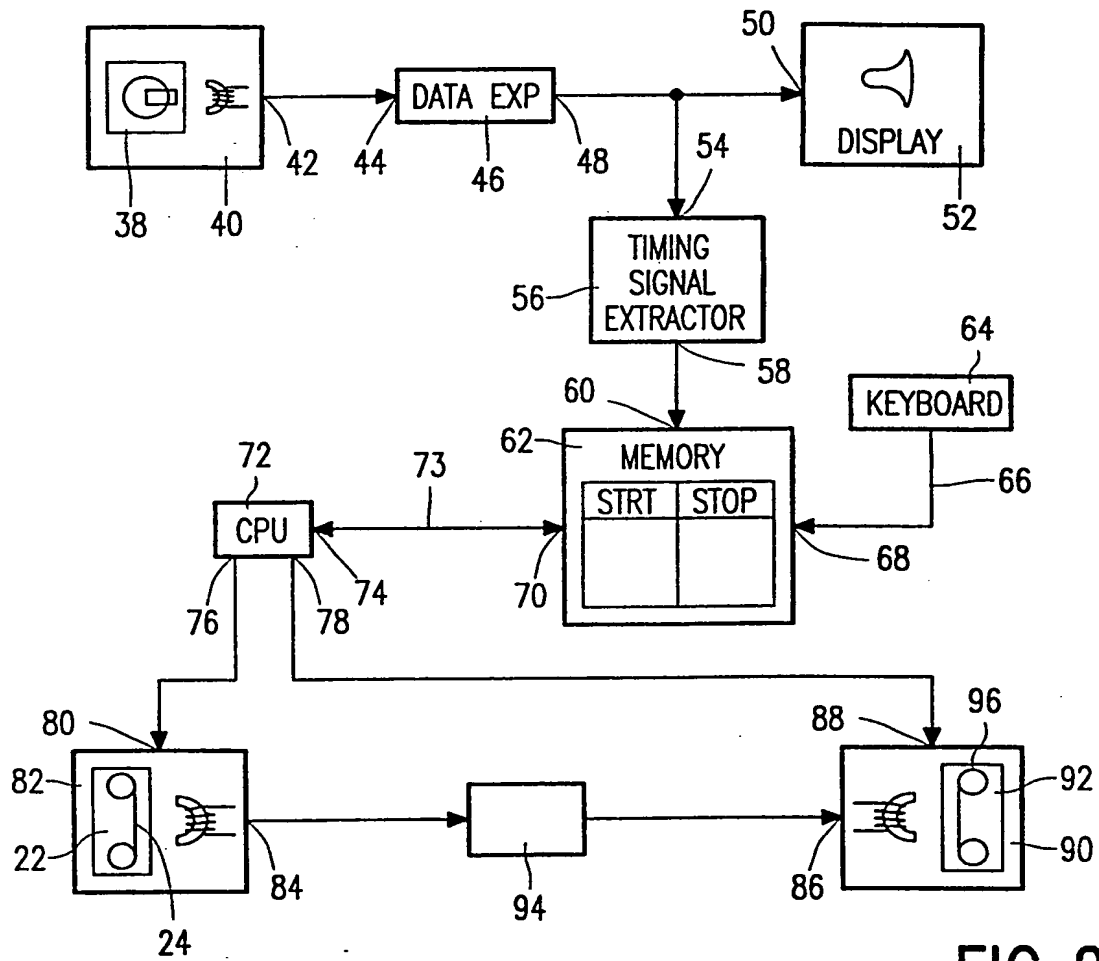
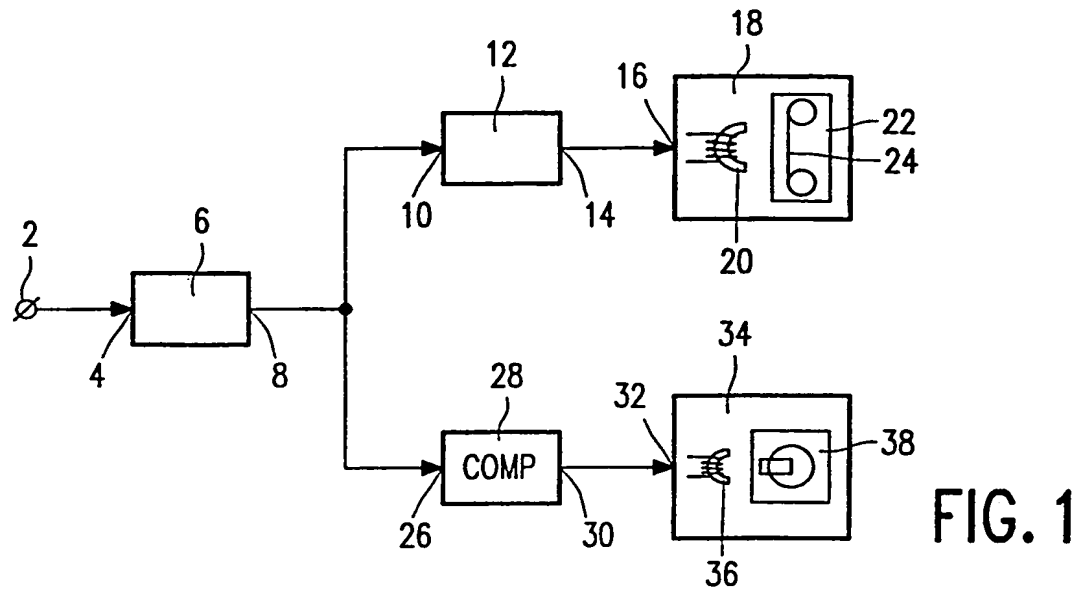
6. Recording arrangement as claimed in anyone of the claims 2 to 5, characterized in that the arrangement is further adapted to transfer the videosignal stored in the random access memory to the record carrier for storage on the record carrier.

7. Recording apparatus as claimed in anyone of the preceding claims, comprised in a videocamera housing.

8. Container for receiving the removable record carrier and the removable

random access memory, comprising a first slot for inserting the removable record carrier and a second slot for inserting the random access memory.

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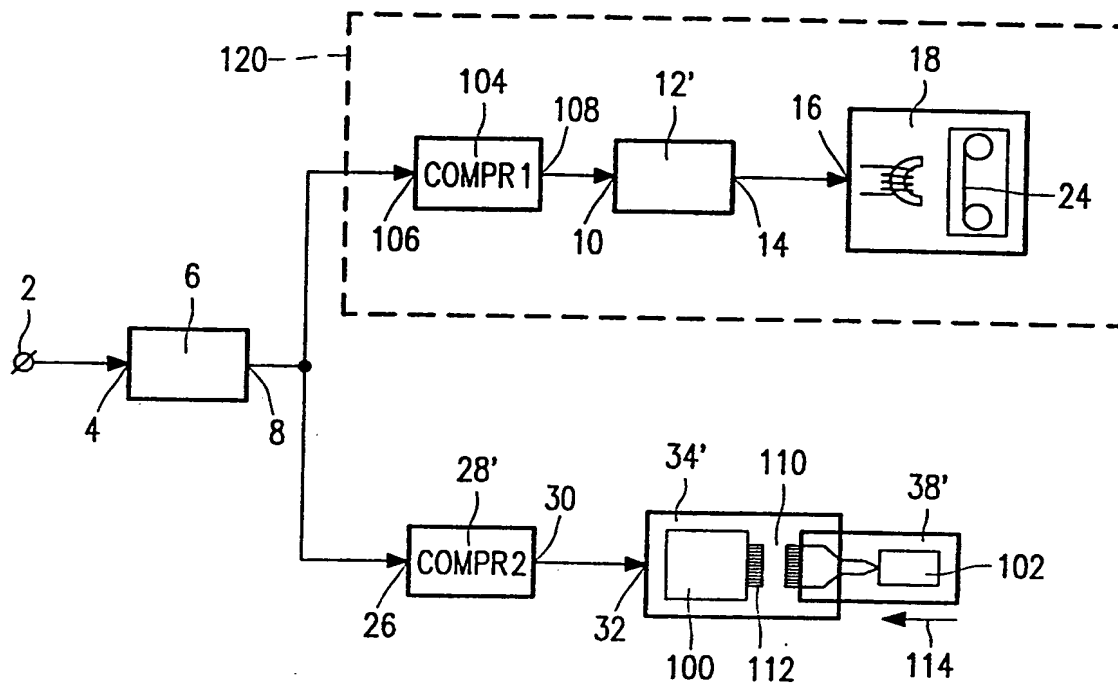


FIG. 3

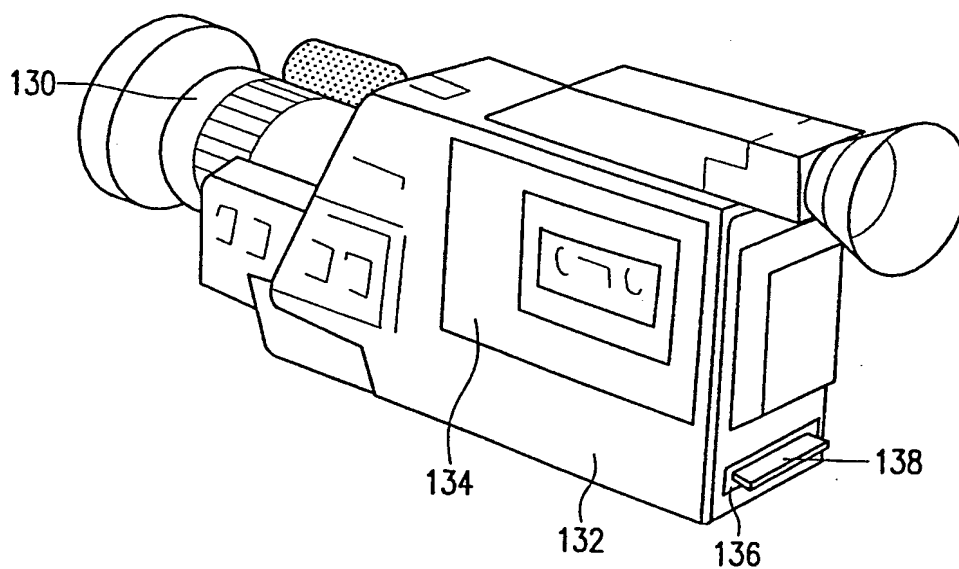


FIG. 4

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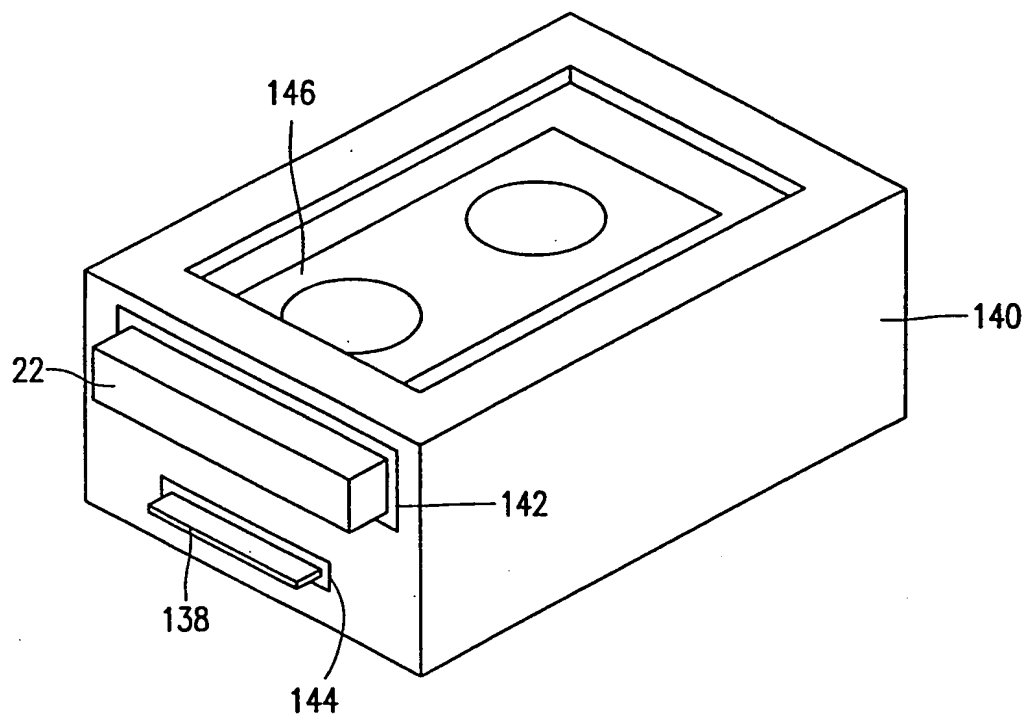


FIG. 5

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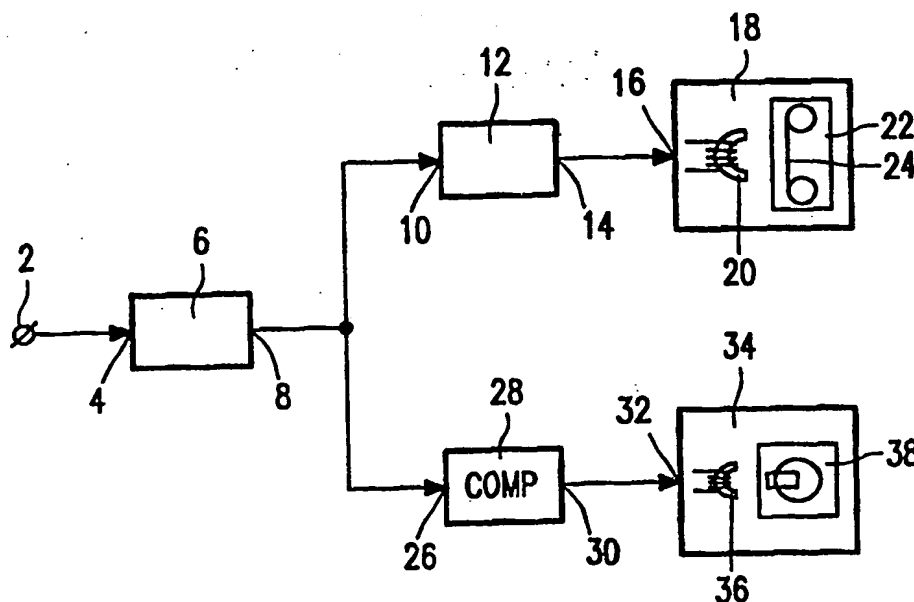
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification 6 :</b> <b>H04N 5/073, G11B 27/10, 27/028, H04N</b> <b>5/907, G11B 27/34, 27/28 // 27/00, 27/031</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 98/18255</b>  <b>(43) International Publication Date:</b> 30 April 1998 (30.04.98)
<b>(21) International Application Number:</b> PCT/IB97/01273  <b>(22) International Filing Date:</b> 13 October 1997 (13.10.97)  <b>(30) Priority Data:</b> 96202908.8 18 October 1996 (18.10.96) EP <b>(34) Countries for which the regional or international application was filed:</b> AT et al.  <b>(71) Applicant:</b> PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).  <b>(71) Applicant (for SE only):</b> PHILIPS NORDEN AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE).  <b>(72) Inventors:</b> SCHMALE, Peter, Christiaan; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). MOELANDS, Antonius, Gerardus; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SNOECK HENKEMANS, Dirk, Pieter; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SLOT, Steven, Thomas; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). STEKELENBURG, Michael, Alwin, Willem; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).		<b>(74) Agent:</b> VAN DER KRUK, Willem, L.; Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).  <b>(81) Designated States:</b> JP, KR, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 18 June 1998 (18.06.98)

**(54) Title:** RECORDING OF AN INFORMATION SIGNAL SO AS TO ENABLE EDITING

**(57) Abstract**

A recording apparatus, such as accommodated in a camcorder housing, is provided with a recording unit (18) for recording a video signal on a removable record carrier (24), such as a magnetic tape accommodated in a cassette (22) which is removable from the apparatus. Further, a storing unit (34) is present for storing a data compressed video signal in a random access memory (38). The random access memory (38) is removable from the apparatus. The apparatus is adapted to simultaneously record the video signal on the removable record carrier (24) and store the video signal in the removable random access memory (38). Further, a timing signal generator unit (6) is present for adding equal timing signals to the corresponding pictures included in the data compressed video signal and in the processed video signal.



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01273

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04N 5/073, G11B 27/10, G11B 27/028, H04N 5/907, G11B 27/34, G11B 27/28  
 // G11B27/00, G11B 27/031

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04N, G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5535063 A (MICHAEL G. LAMMING), 9 July 1996 (09.07.96), figure 3, abstract, see claims --	1-8
Y	US 4425586 A (RICHARD L MILLER), 10 January 1984 (10.01.84), claims 1-8, abstract --	1-8
A	US 4641203 A (RICHARD L. MILLER), 3 February 1987 (03.02.87), claims 1-2, abstract --	1-8
A	US 4963995 A (RICHARD A. LANG), 16 October 1990 (16.10.90), see the whole document --	1-8

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

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Date of the actual completion of the international search

17 April 1998

Date of mailing of the international search report

20 -04- 1998

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01273

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4924387 A (JOHN C. JEPPESEN), 8 May 1990 (08.05.90), claim 1, abstract  --	1-8
A	US 5177645 A (JEROME H. LEMELSON), 5 January 1993 (05.01.93), claim 1  -- -----	1

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01273

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see extra sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No. .

PCT/IB 97/01273

The subject matter of the claims does not constitute a single inventive concept, therefore, there is a lack of unity of the invention.

Independent claims 1 and 2 relates to a recording apparatus for recording an information signal on a removable record carrier or for storing an information signal in a RAM.

Independent claim 8 relates to a container for receiving a removable record carrier and a removable RAM.

The above-mentioned container is designed for keeping both the removable carrier and the RAM physically together so as not to mix carriers & RAM from different origins. This subject-matter does not however possess common technical features with the recording apparatus, which solves the problem to perform an more efficient editing of a video sequence.

Claims 1 and 2 do not possess common technical contributions related to claim 8; there exists a non-unity of invention.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

02/04/98

International application No.

PCT/IB 97/01273

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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